Perceptions of Social Feedback for Exercising at Fitness Facilities during Pregnancy

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Table of Contents

List of Tables

List of Figures

Abstract

Perceptions of Social Feedback for Exercising at Fitness Facilities during Pregnancy

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This research helps fill the gap in the literature relative to examining pregnant women's exercise experience during pregnancy. Specifically, women's perceptions of social feedback they received at fitness facilities as their pregnancy became more apparent to others. This manuscript summarizes the general benefits of exercise, exercise during pregnancy, rates of exercise and misconceptions of exercise during pregnancy, factors influencing exercise during pregnancy, plus the promotion of exercise during pregnancy. This study explored women's perceptions of the social feedback that they received from others while exercising at fitness facilities as their pregnancy became more apparent to others. Factors that may contribute to exercise behavior during pregnancy include physical, situational, social, and personal factors, both pregnancy and non-pregnancy related. Some of these factors, as discussed below, have already been documented in the literature. The aim of the current study was to identify an additional social factor that may influence women's exercise efforts during pregnancy. That factor is perceived social feedback received from others while exercising at a fitness facility as the pregnancy became more apparent to others. Of the 772 women who initiated the survey, 107 met the screening criteria and were included in the Chi squared and cross-tabs analyses. Women reported that they perceived a significant change in positive social feedback or changes in the amount of negative feedback as their pregnancy became more apparent to others. Anecdotal reports of women exercising during pregnancy focus on the negative feedback received, but it was shown here that a change in positive feedback

also occurs. Given sampling limitations, results should be replicated with a larger, more diverse sample and fully powered analyses. As exercise during pregnancy is important for women, it is hoped that future research will address how perceived changes in positive feedback contributes to women's exercise behaviors.

Chapter 1. Background and Introduction

Women engage in physical activity throughout many life stages. One of these life stages is during pregnancy. Exercise has many benefits for the pregnant or non-pregnant woman. Some of these benefits are specific to pregnancy. Despite the benefits to exercising while pregnant, many women do not. There may be several reasons for this lack of exercise in pregnancy, such as fatigue, not being able to find time, or medical problems. The current study explores one possible reason why women are not as physically active during pregnancy as they may be when not pregnant. Specifically, this study addresses the question of whether women perceive that social feedback changed as their pregnancy became more apparent to others. In particular, whether negative and/or positive social feedback increased and/or decreased as the pregnancy became more apparent to others

1.1 Benefits of Exercise

There are countless benefits, physical and mental, to exercise. Some of the benefits of regular exercise include lowered risk of cardiovascular disease, colon cancer, and diabetes (Sampselle, Send, Yeo, Killion, & Oakley, 1999). Exercise has also been linked to lowered mortality, lower weight, and increased psychological well-being (Sampselle, et al., 1999). Running during pregnancy can improve mood, increase energy, and help improve sleep quality (Goucher, 2011). In women, exercise is a strong factor in increasing positive mood as well as lowering symptoms of anxiety and depression and developing an empowered sense of self (Sampselle, et al., 1999).

The guidelines for adults aged eighteen to sixty-four in the general population for exercise is at least 150 minutes per week of moderate intensity exercise, and muscle

strengthening exercises at least two days a week (CDC, 2008). Alternatively, adults can engage in at least 75 minutes of vigorous intensity exercise each week and two days of muscle strengthening exercises (CDC, 2008).

1.2 Exercise during Pregnancy

According to the Center for Disease Control (CDC) (2008), the guidelines for exercise for pregnant women in the general population is at least 150 minutes a week of moderate intensity exercise. According to the American College of Obstetrics and Gynecologists (ACOG), this exercise should be done in intervals of up to 30 minutes a day, most days if not every day (Artal & O'Toole, 2003). Moderate intensity exercise includes activities such as brisk walking, while vigorous intensity exercise includes activities like jogging (CDC, 2008). If a woman was not active before pregnancy, she should gradually work up to 30 minutes a day of physical activity during pregnancy (Artal & O'Toole, 2003). A previously active woman who becomes pregnant should not intensify her exercise regimen after becoming pregnant (Artal & O'Toole, 2003). Some physicians recommend that a pregnant woman should not exercise for more than 45 minutes at a time due to the risk of overheating and the risk of upsetting the energy balance (Artal & O'Toole, 2003), however more evidence is needed.

Exercise during pregnancy has been shown to have many benefits including physical and mental health benefits for the mother, benefits to the developing baby, and benefits during labor and delivery. Pregnancy exercise has been shown to relieve backaches, improve sleep, raise mood and energy levels, and help to prevent diabetes in pregnancy (Siddique, 2013; Solé, 2014). Running while pregnant has been shown to improve posture, improve muscle tone, strength, and endurance, and to improve ability to

cope with labor pain (Goucher, 2011). Women can continue to run up until the third trimester unless instructed not to by their individual healthcare provider (Goucher, 2011). The length of labor and the potential need for medical intervention during birth decreases when a woman is active during pregnancy (Solé, 2014; May, Glaros, Yeh, Clapp, & Gusrafson, 2010). Women who are active during pregnancy also recover faster after delivery (May, et al., 2010).

During the second trimester, the benefits of exercise can be achieved in as little as an hour a week. Women who had engaged in moderate exercise for twenty minutes three times a week have babies whose brains are more fully developed (Siddique, 2013). The infants at 8 to 10 days of age are more easily able to discriminate between sounds using a lower amount of brain energy, hypothesized to be evidence of an efficient auditory memory process (Geddes, 2013; LeMoyne, Curnier, St-Jacques, & Ellemberg, 2012). Exercise during pregnancy also may increase the levels of brain-derived neurotropic factor and mitochondrial activity in the fetal brain (Siddique, 2013; Geddes, 2013).

Infants of mothers who engaged in aerobic exercise above 55% of their maximum volume of useable oxygen (VO2 max) for 20 minutes at least three times a week have higher scores on the Brazelton Neonatal Behavioral Assessment Scale five days after birth (LeMoyne, et al., 2012). Infants from active mothers also have higher scores on the Bayley Scales of Infant Development one year after birth (LeMoyne, et al., 2012).

Aerobic exercise for greater than thirty minutes three times a week in pregnancy can improve the heart health of developing infants. At 36 weeks gestation, fetal heart rate was lowered and heart rate variability was significantly increased in the exercise group (May, et al., 2010). The reduction in fetal heart rate has been determined not to be

caused by a lack of oxygen and does not place the developing fetus in distress (May, et al., 2010). The lowered fetal heart rate coupled with the increase in heart rate variability suggests healthy development of the autonomic nervous system in the exercise group (May, et al., 2010).

1.3 Time Spent Exercising

Women, whether pregnant or not, are less likely to spend time participating in vigorous physical activity than men (Sampselle, et al., 1999). Azevedo, Araujo, Reichert, Siqueira, da Silva, Hallal (2007) examined a population of urban individuals at least 20 years of age and found that men were more active than women according to the International Physical Activity Questionnaire. It is possible that due to the increased social pressures of pregnancy, such as the stereotype that women take pregnancy as a "time off" from exercising and eating healthy, that exercise declines even further during this time.

There are several factors that may lead women to exercise less often during pregnancy (Hausenblas, Downs, Giacobbi, Tuccitto, & Cook, 2008). Some hypothesized reasons for the decline in activity include "morning sickness" in the first trimester, along with the increasing size of the body in the second and third trimester (Hausenblas, et al., 2008). Perhaps women feel a decreased sense of personal control over exercise behavior during pregnancy due to psychological and physical changes occurring (Hausenblas, et al., 2008). It is also possible that misconceptions of the risks of exercise during pregnancy can influence women's exercise behavior.

1.4 Misconceptions about Exercise during Pregnancy

Exercise has historically been viewed as a risky and discouraged activity for pregnant women and there is a fair amount of stigma associated with exercise during pregnancy (Desborough & Boon, 2014). The conventional thinking was that rest was important for a baby's safety during pregnancy and exercise was discouraged (Siddique, 2013). As recently as 1999, it was cited that exercise in pregnancy has neither positive nor negative effects (Sampselle, et al., 1999). In addition, there was little emphasis on the importance of exercise in nursing and obstetric textbooks (Sampselle, et al., 1999).

Some common myths about exercise in pregnancy are that the pulse must stay below 140, where in truth there is no heart rate limit as long as the woman is well hydrated and not overheated (Goucher, 2011). Another myth is that the woman must not raise her arms above her head during strength training or do abdominal work, both of which are also false (Goucher, 2011). The abundance of myths about exercise during pregnancy may lead to the decline in exercise behavior during pregnancy.

According to Clarke and Gross (2004), the present health education fails to correctly inform women of the risks and benefits associated with physical exercise during pregnancy. Duncombe, Werthein, Skouteris, Paxton, and Kelly (2009) found that women hold opinions about the safety of exercise during pregnancy, and that believing exercise to be unsafe reduces the likelihood they will participate in exercise during pregnancy.

1.5 Factors Influencing Exercise during Pregnancy

Factors that may contribute to exercise behavior during pregnancy include physical and social factors, both pregnancy and non-pregnancy related. Some of these factors, as discussed below, have already been documented in the literature. The aim of

the current study is to identify an additional social factor that may influence women's exercise efforts during pregnancy. That factor is social feedback received from others.

Physical factors related to pregnancy include morning sickness or nausea (Hausenblas, et al., 2008) and the increasing size of the body during the second and third trimesters (Hausenblas, et al., 2008). Such physical changes may make it difficult for a woman to stay with her pre-pregnancy exercise routine. Additional possible physical factors contributing to a woman's level of exercise during pregnancy include pregnancy related aches and pains, fatigue, and difficulty exercising while pregnant.

As mentioned earlier, pregnancy is a time when women face increased social pressures regarding the health of their baby, such as taking time to rest and not engage in strenuous activity (Sampselle, et al., 1999). Subjective norms, defined as the perceived social pressure to perform an activity, may be a factor influencing exercise behavior during pregnancy (Hausenblas, et al., 2008). This perceived social pressure could have a positive or negative effect. Personal beliefs about the safety of exercise during pregnancy may be an additional factor that causes a decline in activity.

Women in the gym, whether pregnant or not, are constantly interacting with those around them. Personal accounts of pregnant women in the gym often reflect negative interactions with peers. For example, some women report continuous stares, whispering, and negative comments (Desborough & Boon, 2014; Solé, 2014). This type of behavior can be considered a form of bullying. In other cases, some pregnant women receive positive feedback, such as a "thumbs up" sign, indicating support for their physical activity. It has been documented that although women appreciate encouragement, the praise can be overwhelming (Desborough & Boon, 2014; Solé, 2014).

1.6 Promotion of Exercise during Pregnancy

Hausenblas and colleagues (2008) found that pre-pregnancy exercise behavior did not predict pregnancy exercise behavior. Perceived behavioral control was positively associated with exercise intention during pregnancy; however there was no actual increase in exercise behavior during pregnancy (Hausenblas, et al., 2008). Additionally, it was found that women who had been active previously declined in exercise behavior throughout pregnancy (Evenson, Savitz, & Huston, 2004). These results indicate a need for determining the factors that cause a decrease in exercise during pregnancy. Hausenblas, et al. (2008) stated the need for an understanding of the psychological variables modulating pregnancy exercise behavior. In addition, once the factors are identified, programs that are aimed at promoting exercise during pregnancy that address identified obstacles could be developed.

In the general population, social support is known to decrease mortality (Reblin & Uchino, 2008). Receiving support from others is tied to lower rates of cardiovascular disease (Reblin & Uchino, 2008) and lower cortisol levels (Hernandez & Blazer, 2006). One type of support is "informational support" or support in the form of valuable information, such as lifestyle tips or advice (Hernandez & Blazer, 2006). In relation to this study, comments that women receive at a fitness facility while exercising while pregnant may be considered informational support if the women receive any advice from other patrons. The current study is designed to assess social feedback that women perceive that may be supportive in nature. Research by De Strobbeleir, Ashford and Buyens (2011) explored direct verbal and indirect feedback cues in the work environment and found that seeking feedback enhanced performance. The current study represents an

initial step in extending research on perceived social feedback to the previously unexplored population of pregnant women exercising at fitness facilities.

Chapter 2. The Current Study

2.1 Rationale

As highlighted in the prior chapter, exercise confers many mental and physical health benefits for pregnant women and their infants. Still, there is evidence that many women do not comply with the recommendation set forth by the CDC and ACOG. Informal reports indicate that this may be due to barriers such as time, and expectations that pregnancy is a time for "relaxation," as well as symptoms of pregnancy itself, such as fatigue. Motivation to exercise also may be impacted by feedback received from others, including negative responses and comments which make pregnant women question the appropriateness of exercising in their current state of pregnancy. There is no formal research examining pregnant women's experience of exercise during pregnancy, specifically women's perceptions of social feedback they received at fitness facilities as their pregnancy became more apparent to others. The aim of the current study was to explore women's perceptions of the social feedback that they received from others while exercising at fitness facilities as their pregnancy progressed.

2.2 Research Question and Hypotheses

The research question is as follows: Will women report that they perceived a change in social feedback while exercising at a fitness facility as their pregnancy became more apparent to others? Social feedback is defined for this study as the messages, direct or indirect, that someone perceives about themselves or their behavior from other people while engaging in an activity where other people are present.

Null hypothesis one is that women will not report that they perceived a change in negative social feedback while exercising at a fitness facility as their pregnancy became

more apparent to others. The alternate hypotheses are that perceived negative feedback may increase, decrease, or stay the same.

Null hypothesis two is that women will not report that they perceived a change in positive social feedback while exercising at a fitness facility as their pregnancy became more apparent to others. The alternate hypotheses are that perceived positive feedback may increase, decrease, or stay the same.

Chapter 3. Methods

3.1 SurveyMonkey

Participants were passively recruited online using SurveyMonkey. The purpose of the study was explained to the participants on the consent page of the survey as research that intends to examine the relationship between exercise and social feedback. Informed consent was obtained from all individuals when they signed up to complete SurveyMonkey surveys (SurveyMonkey, 2015). Participants were informed by SurveyMonkey (2015) that their participation offers little to no harm and discontinuing the study will not affect them in any way. Participants were not offered any direct compensation for their participation, however the charity of their choice received fifty cents for each survey completed (SurveyMonkey, 2015). While the list of charities is extensive, participants cannot create their own charity to which the fifty cents will be donated for every survey completed.

When individuals sign up to complete surveys for SurveyMonkey, they are informed that their confidentiality and anonymity will be maintained by only allowing the principal investigator and any research assistants to access the data collected (SurveyMonkey, 2015). No identifying participant information is collected so all responses remain confidential and anonymous (SurveyMonkey, 2015).

The SurveyMonkey volunteers provided and updated profile (i.e., demographic) information regularly. The demographic information collected regarding all volunteers includes gender, age, geographic location, number of children and other information. The standard information collected by SurveyMonkey can be used as inclusion criteria for determining who will be invited to complete surveys. Standard SurveyMonkey

demographic information does not include data about pregnancy status or whether one exercised at a fitness facility while pregnant.

3.2 Participants and Recruitment

The intention was to recruit a diverse sample of pregnant women to best reflect the demographics of a large population and to be more generalizable. The recruitment was completed online using a subscription to SurveyMonkey as the database had the potential to provide a sample of participants from varied ethnic and racial backgrounds as well as individuals from different socioeconomic brackets across the United States.

The survey had 18 questions. The first four survey questions are qualifying questions also referred to as the exclusion criteria. The standard information collected by SurveyMonkey can be used as inclusion criteria for determining who was invited to complete the survey. It did not include data about pregnancy status or whether one exercised at a fitness facility while pregnant. The first question confirms that the survey respondent is not pregnant. As it is possible to acquire children via other than personally being pregnant, the second survey question disqualified any women who met the prior filtering requirements, who were not currently pregnant, but who did not acquire children via being personally pregnant. The third disqualifying question asked whether the respondent exercised at a fitness facility during pregnancy, and eliminated remaining women who have already answered question one as no (not currently pregnant) and question two as yes (were previously pregnant). The fourth disqualifying question eliminated the remaining women who answered no to question one, and yes to questions two and three (exercised at a fitness facility during pregnancy) by asking if they continued exercising at a fitness facility while their pregnancy was apparent to others. If

they answered no, then the survey ended. The remaining women constituted the sample (Appendix D). Data is available regarding how many women were eliminated by each of the disqualifying questions (Table 1, Appendix B).

The filtering parameters selected to define who was included to complete the survey are that the respondents are women who are at least 18 years old and not older than 45 years of age, who reside in the United States with children. Additional inclusion criteria that must have been met included that the women exercised at a fitness facility while they were visibly pregnant. Exclusion criteria included women who were under the age of 18 and over the age of 45, women who have not had children, women who did not exercise during their pregnancy while visibly pregnant, and women who did not exercise at a fitness facility while pregnant.

3.3 Measures

The measure utilized was the survey that was specifically designed for this study (See Appendix A). The survey consisted of feedback and demographic questions, and was developed using SurveyMonkey. After individuals agreed to participate they completed the survey. There were no assessments following completion of the survey.

3.3.1 Demographics

The demographics collected included participant's age, socioeconomic status (average household income, highest level of education, and employment), ethnicity/race, and religion. This information was gathered to indicate the level of diversity of the sample used in the study.

3.3.2 Feedback Questions

The feedback questions developed for the current study assessed women's perceptions of social feedback received when exercising at a fitness facility while visibly pregnant. The next to the last question was an opportunity for respondents to make comments and/or share experiences. The last item on the survey was a contact form for any respondents with questions and/or would like to be contacted by the researcher.

3.4 Power Analysis

The required sample size was calculated for this research project using the G*Power 3.1.9.2 program (Faul, Erdfelder, Lang, & Buchner, 2007; Faul, Erdfelder, Buchner, & Lang, 2009). Two hypotheses were tested with Chi-Squared Goodness-of-fit tests. With the Effect size w set at .25, the alpha level set at .05 and the Power set at .80, a sample size of 206 was required.

3.4.1 Data Analysis Plan

The data being collected was nominal (also known as categorical). The four categories were increased, decreased, no change, and no reported feedback. There was one sample. This was a non-experimental study that was concerned with the relationship of perceived social feedback while exercising at a fitness facility while the pregnancy became more apparent to others. Demographic statistics are presented below. The research question asked whether women reported that they perceived a change in social feedback while exercising at a fitness facility as their pregnancy became more apparent to others. Chi-square goodness of fit was used to determine if perceived social feedback increased as pregnancy became more apparent to others. Null Hypotheses One and Two separately hypothesized that the perception of negative and positive social feedback

would not change as the pregnancy became more apparent to others. Alternative Hypotheses for Null Hypotheses One and Two separately hypothesized that perceived negative feedback will increase and positive social feedback will decrease for pregnant women. It was expected that it would be reported that perception of social feedback while exercising at a fitness facility as the pregnancy became more apparent to others changed, resulting in rejection of the Null Hypotheses One and Two. In turn, it was expected that the answer to the research question will be the following: Women reported that they perceived a change in social feedback (increased negative and decreased positive) while exercising at a fitness facility as their pregnancy became more apparent to others.

Chapter 4. Results

4.1 Demographics

Surveys were completed by 772 respondents, who were all female (100%) and ranged in age from 18 to 45 years, with 49.52% being in the age range of 30 – 39 years. Ninety-three point twenty-six percent of the 772 respondents were not pregnant at the time of the study, allowing them to move forward to question two. Of the 715 participants that moved forward, 50.35% had been pregnant and given birth within the last five years. Of these 360 respondents, 36.21% exercised at a fitness facility where other people were also exercising. The final screening question was met by 86.15% of 130 participants, indicating that they continued to exercise at a fitness facility while visibly pregnant. Therefore, of the initial 772 respondents enrolled, 130 met the screening criteria and 107 completed the survey and are included in the final analyses.

Caucasians made up the largest proportion of the 107 participants (80.95%), followed by Hispanic or Latina (5.71%). The remainder of the participants identified as Black or African American (4.76%), Asian or Pacific Islander (3.81%), American Indian or Alaskan Native (0.95%), and prefer not to answer (6.67%). Participants were able to select all responses that applied in terms of race/ethnicity. Additional demographics are shown in Table 2 (Appendix C).

4.2 Pregnancy Experience

The majority of the 107 respondents reported that the reference pregnancy was their first pregnancy (57.94%). More than three-fourths of respondents (78.50%) identified that they became visibly pregnant in exercise clothes in the

second trimester. The remaining participants became visibly pregnant in exercise clothes in the first trimester (7.58%) and the third trimester (14.02%).

Most of the respondents (51.4%) reported feeling somewhat confident exercising during pregnancy. The remaining participants reported feeling very confident (42.06%) or not at all confident (6.54%) exercising during pregnancy. These results are presented in Figure 1.

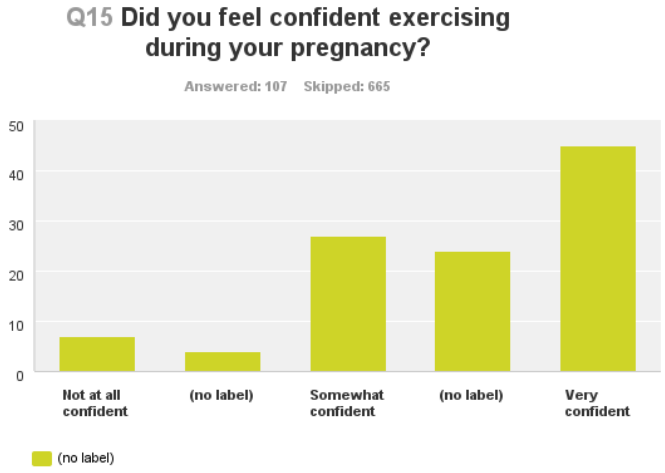

Figure 1. Confidence Exercising During Pregnancy

The majority of the 107 participants (71.03%) indicated they believed exercise is very important during pregnancy. The remaining participants (28.98%) indicated they believed exercise is somewhat important during pregnancy. These results are presented in Figure 2.

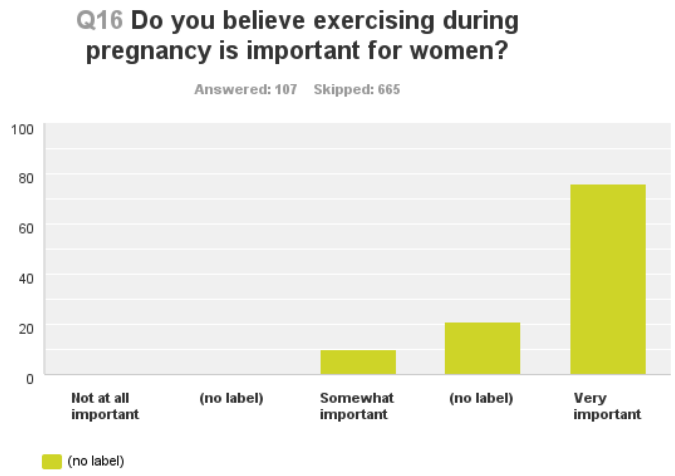

Figure 2. Importance of Exercise During Pregnancy.

Of the 107 women in this study who exercised during pregnancy, 38.32% of the women exercised throughout their entire pregnancy. The majority (51.4%) ceased exercising in the third trimester. Of the remaining women, 7.48% stopped exercising in the second trimester and 0.93% stopped exercising in the first trimester. These results are presented in Table 3.

Table 3

Duration of Exercise in Pregnancy

Trimester	Total (n)	%
First Trimester	1	0.93
Second Trimester	8	7.48
Third Trimester	55	51.4
Did not stop	41	38.32
Do not recall	1	0.93
Other	1	0.93
Totals (N = 107)		

Presented below in Table 4 are the results of why women stopped exercising during their pregnancies. The majority of the 107 women surveyed (28.05%) stopped exercising because they were uncomfortable. Other common reasons for stopping exercise during pregnancy were fatigue (18.29%) or a medical condition, such as high blood pressure (18.29%). Seven point thirty-two percent of women ceased exercise because they reported being stressed or "too busy", while 23.17% of women exercised to the end of their pregnancy. No participants reported that they stopped exercising due to the social feedback that they received.

Table 4

Reasons Women Stopped Exercising during Pregnancy

Reason	Total	%
Uncomfortable	23	28.05
Fatigue	15	18.29
Medical Condition	15	18.29
Stress/Too busy	6	7.32
Other	4	4.88
Did not stop	19	23.17
Totals (N = 107)		

4.3 Negative Nonverbal Feedback

Of the 107 respondents, the majority (60.75%) did not experience any negative nonverbal feedback while exercising at a fitness facility while visibly pregnant. An increase in negative nonverbal feedback was experienced by 21.5% of

respondents and 2.80% of respondents noticed a decrease in negative nonverbal feedback, while 14.95% experienced no change in negative nonverbal feedback (See Figure 3).

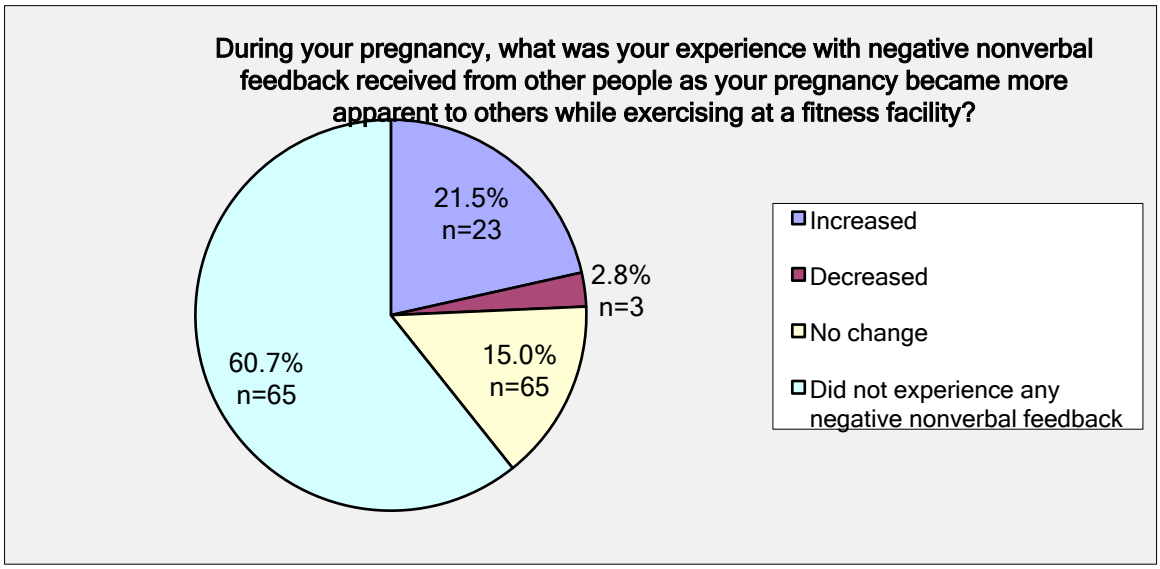

Figure 3. Negative Nonverbal Feedback Received While Exercising at a Fitness Facility During Pregnancy.

4.4 Positive Nonverbal Feedback

The majority of participants (57.01%) reported an increase in positive nonverbal feedback while exercising at a fitness facility while pregnant. The remaining participants did not experience any positive nonverbal feedback (19.63%), experienced no change in positive nonverbal feedback (17.76%), and experienced a decrease in positive nonverbal feedback (5.61%). See Figure 4 for a graphical representation of these results. There is no statistical evidence to suggest that the amount of negative feedback received is significantly related to the amount of positive feedback received. Participants who experienced an increase in positive feedback were just as likely to have experienced an increase, decrease, or no change

in negative feedback. In fact, 22 participants experienced increased nonverbal negative feedback with 8 of these same 22 participants also reporting experiencing increased nonverbal positive feedback. Further analysis documented that there was no consistent or predictable relationship between an increase in negative feedback and whether positive feedback increased or decreased.

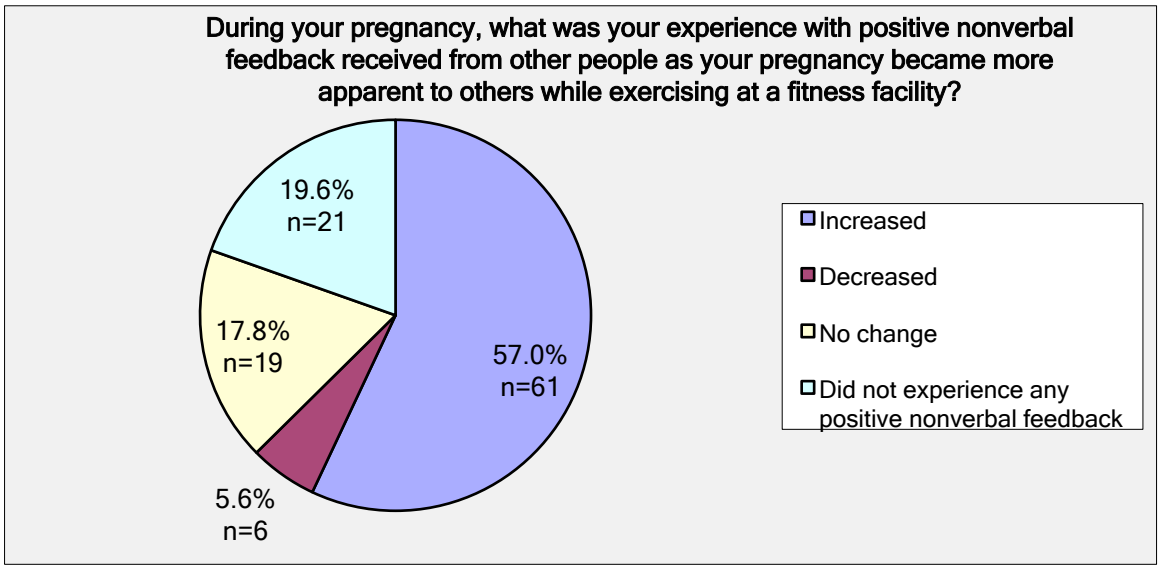

Figure 4. Positive Nonverbal Feedback Received While Exercising at a Fitness Facility During Pregnancy.

4.5 Negative Direct Comments

Most of the 107 participants (66.36%) did not experience any direct negative comments while exercising at a fitness facility while visibly pregnant. The remaining participants indicated no change in direct negative comments (21.5%), an increase in negative direct comments (9.35%), or a decrease in direct negative comments (2.8%; See Figure 5).

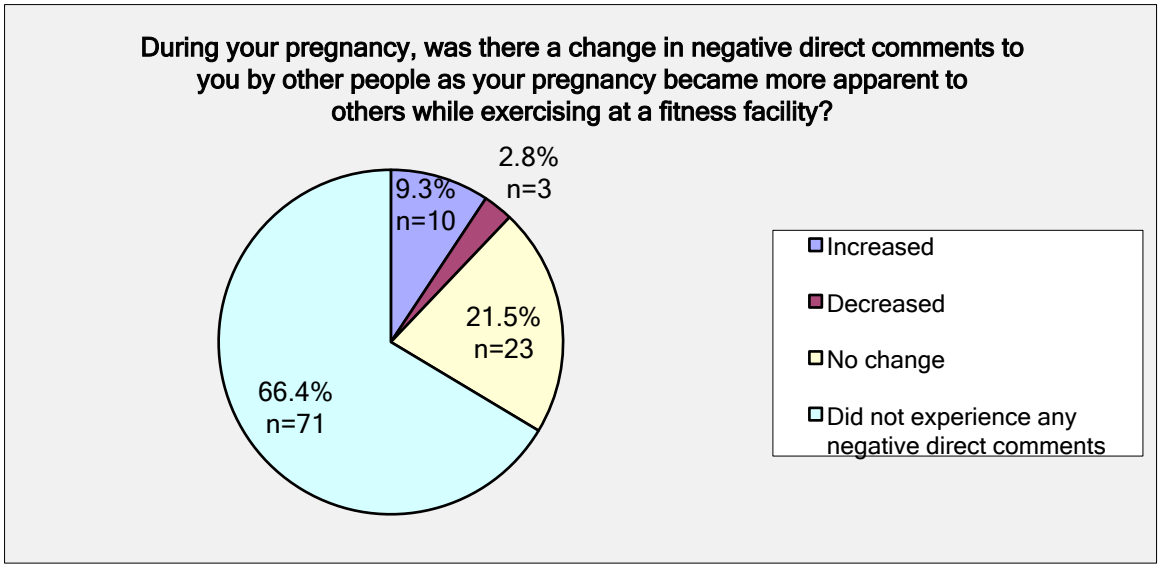

Figure 5. Negative Direct Feedback Received While Exercising at a Fitness Facility During Pregnancy.

4.6 Positive Direct Comments

The majority of the 107 participants (48.6%) reported an increase in the amount of positive direct comments they received while exercising at a fitness facility while visibly pregnant (See Figure 6). Few participants (2.8%) reported a decrease in positive direct comments, while the remaining participants reported either no change in positive direct comments (23.36%) or did not experience positive direct comments (25.23%).

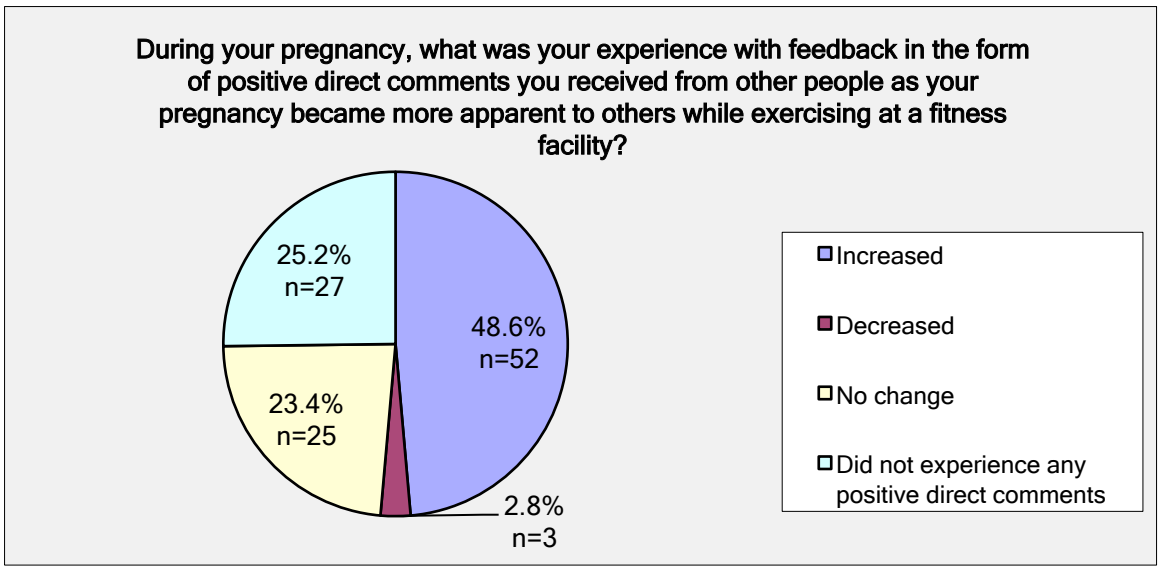

Figure 6. Positive Direct Feedback Received While Exercising at a Fitness Facility During Pregnancy.

4.7 Negative Indirect Comments

Most of the 107 participants (71.03%) did not experience any negative indirect comments, while 13.08% of participants reported no change in the negative indirect comments they experience while exercising at a fitness facility while visibly pregnant. The remaining participants experience either an increase (11.21%) or decrease (4.67%) in negative indirect feedback (See Figure 7).

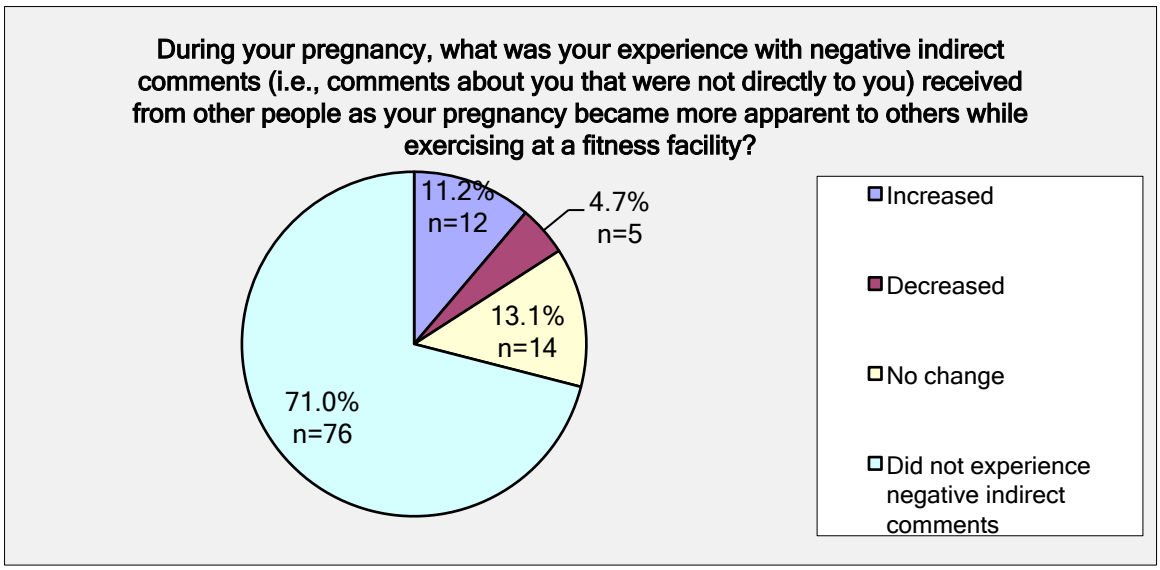

Figure 7. Negative Indirect Feedback Received While Exercising at a Fitness Facility During Pregnancy.

4.8 Positive Indirect Comments

It should be noted that while most of the 107 participants (45.79%) did not experience positive indirect comments while exercising at a fitness facility while pregnant, 26.17% of participants experienced an increase in positive indirect comments. Of the remaining participants, 23.36% experienced no change in positive indirect comments and 4.67% experienced a decrease in positive indirect comments (See Figure 8).

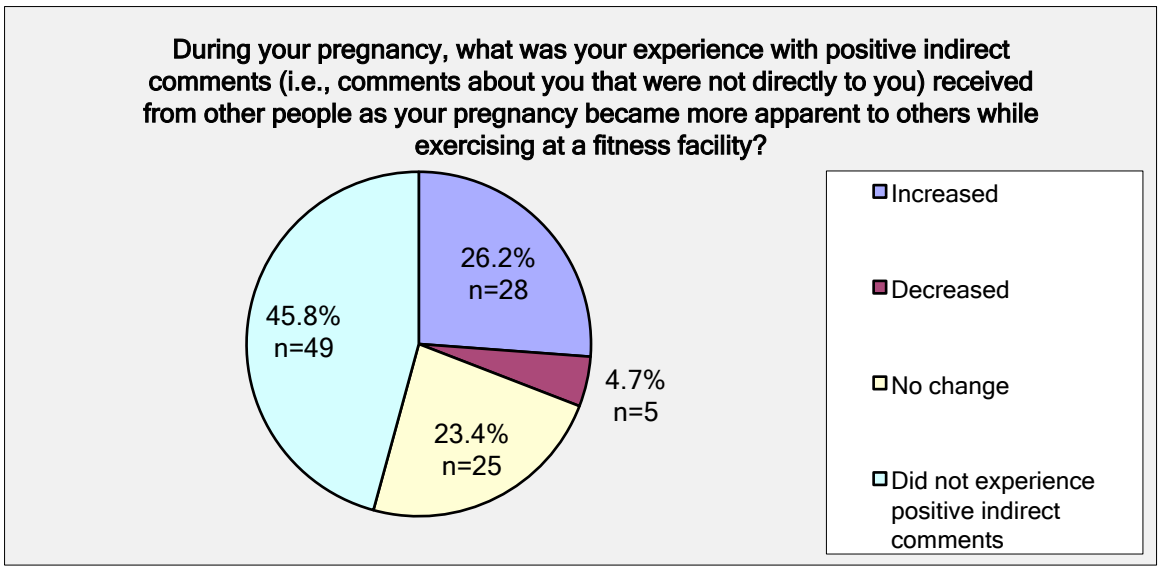

Figure 8. Positive Indirect Feedback Received While Exercising at a Fitness Facility During Pregnancy.

4.9 Rejection of Null Hypothesis One

Null hypothesis one stated that women would not report that they perceived a change in negative social feedback while exercising at a fitness facility as their pregnancy became more apparent to others. Using the Chi-Square goodness of fit test, it was shown that there was a significant change in the amount of negative indirect social feedback some women perceived while exercising at a fitness facility as their pregnancy became more apparent to others, χ^2 (3, N = 107) = 122.57, p < .01. Some women also perceived a significant change in negative direct social feedback as their pregnancy became more obvious, χ^2 (3, N = 107) = 105.29, p < .01. A significant change in the perception of negative nonverbal feedback was also found, χ^2 (3, N = 107) = 80.63, p < .01. Results should be considered preliminary given that analyses were not fully powered.

4.10 Rejection of Null Hypothesis Two

Null hypothesis two stated that women will not report that they perceived a change in positive social feedback while exercising at a fitness facility as their pregnancy became more apparent to others. Using the Chi-Square goodness of fit test, it was shown that women do perceive a significant change in positive indirect social feedback while exercising at a fitness facility as their pregnancy became more apparent to others, $\chi^2(3, N = 107) = 34.72$, $p < .01$. Women also reported perceiving a significant change in the amount of positive direct social feedback while exercising at a fitness facility as their pregnancy became more obvious, χ^2 $(3, N = 107) = 45.04$, $p < .01$. Additionally, a significant change was found in the perception of positive nonverbal feedback as the pregnancy became more apparent to others, χ^2 $(3, N = 107) = 95.26$, $p < .01$. However, the analyses were underpowered and results should be interpreted as preliminary until further research is conducted.

4.11 Personal Experiences of Exercise during Pregnancy

Seventeen participants elected to leave additional comments about their experience of exercising at a fitness facility while visibly pregnant. These comments represented women who had both positive and negative reactions to exercising while visibly pregnant. One of the responses is included below.

> "I found that while pregnant, people found themselves more likely to comment about my physical condition/body overall, including about my exercise habits. I noticed a big uptick in people commenting and wanting to offer advice, that pretty much disappeared once I wasn't pregnant. I think there is some sort of cultural norm that gives people the right to comment on pregnant people's habits and bodies in the US."

Chapter 5: Discussion

In this study, social feedback was examined as a factor that might influence women's exercise behavior during pregnancy. This study sets a benchmark for this investigation as it is the first study to take into account the direct and non-direct comments and gestures pregnant women reported experiencing from others while exercising at a fitness facility while visibly pregnant. It was found that social feedback is a factor that women noticed while exercising during pregnancy.

Positive feedback, in the form of direct comments, indirect comments, and nonverbal feedback was recognized by pregnant women exercising in a fitness facility. The women surveyed reported a significant variation as their pregnancy became more obvious to others in that they reported more positive feedback while exercising during pregnancy as opposed to exercising before they were pregnant. Women surveyed reported increased nonverbal positive feedback, increased direct positive feedback, and increased indirect positive feedback. One woman's experience exemplifies this finding:

> "I experienced an overwhelming amount of support and encouragement while exercising at the gym."

Women surveyed reported a significance change in the amount of negative feedback they perceived while exercising at a fitness facility during pregnancy. There is currently literature suggesting that women receive negative feedback while engaging in exercise during pregnancy, which agrees with these findings. One woman did report anecdotal evidence that she had received negative feedback about her pregnancy exercise habits from an unlikely source:

> "The most negative feedback I received about my exercise was with one of the nurses that worked at my Ob/Gyn's office. She felt the only safe exercise during pregnancy was walking and slow swimming and everything else would cause a miscarriage or birth defect. Unfortunately there are still persistent myths about exercise and pregnancy in the prenatal health field. They have not quite caught up to the science."

Currently, obstetric health providers are to recommend 20 - 30 minutes of moderate intensity exercise on most if not all days of the week to pregnant women (ACOG, 2015). In a recent study of provider counseling, it was found that although providers give information about exercise to pregnant women, the specific guidelines are not always being followed (Whitaker, Wilcox, Liu, Blair, & Pate, 2016). However, receiving counseling on physical activity increased most women's levels of activity throughout their pregnancy (Whitaker, et al., 2016).

Importantly, although women did report noticing changes in social feedback during pregnancy, no women reported ceasing exercise due to the social feedback they received. This is positive in light of the fact that some of the women in the sample did receive negative feedback. Potential reasons for this finding could be due to confidence and the knowledge of the women, as detailed below. Of the women who exercised until the end of their pregnancy, additional research could be undertaken to determine if this was due to an increase in the positive feedback they received or due to the lack of negative feedback they received.

Literature also suggests a lack of education to women, medical professionals, and the public on the importance of exercise during pregnancy (Sampselle, et al., 1999). Findings of this study indicate, however, that the majority of women surveyed felt that exercise is "very important" during pregnancy. Future research could include questions aimed at determining where women get their information

about the safety of exercise during pregnancy. This information could be used to develop programs that disseminate appropriate and accurate information to pregnant women. Perhaps an avenue of promotion could involve the inclusion of activities of daily living such as household chores, or the use of an "exercise prescription" given to women by their obstetrician. Anecdotal evidence from one woman in the study details her reasons of finding exercise during pregnancy important:

> "I feel strongly that working out my entire pregnancy helped me have a quick and easy labor (8 minutes of pushing for first time!) and also helped me bounce back very quickly. I plan to work out throughout my future pregnancies."

The majority of women surveyed in this study reported feeling confident exercising while visibly pregnant. The confidence of the women exercising may be a reason that they did not perceive a large amount of negative feedback. It could be that while the women were proud of themselves for being in the gym while pregnant that they were not expecting or paying attention to any negative feedback. One woman reported that her confidence came from having a personal trainer:

> "I felt confident while exercising during my pregnancy because I had a personal trainer that helped me learn appropriate exercises."

However, some women reported that they did not feel confident exercising during pregnancy, or were not able to continue exercising for as long as they had liked to:

> "I felt strange exercising too much while pregnant."

> "I wanted to continue exercising throughout my pregnancy, as I had always exercised and wanted to keep it up, but it became hard due to being tired and/or uncomfortable."

5.1 Limitations of the Current Study

In terms of racial and ethnic variability, the study sample was largely Caucasian, and did not include a high number of participants who were Hispanic or from other racial groups. The sample was also highly educated as most respondents had a college degree or above. If this research were to be replicated, it would be important to include a more diverse sample. The sample size of this study was also limited, as the target sample of 206 respondents was not reached. As a result, analyses reported in this study are underpowered. Many women within the pool of registered SurveyMonkey users may not have qualified for this study as they might have stopped exercising before they became visibly pregnant. In addition, all women who participated in this study were registered SurveyMonkey users. As such, the sample was restricted to those women who elected to complete surveys through this platform, indicating that they have a desire to share their opinions in exchange for SurveyMonkey making a charitable donation. Further studies should aim to collect more responses from varying locations and demographics to promote generalizability of findings.

This study was retrospective as the women were answering questions about their pregnancy after they had given birth. In some instances, this was a lapse of five years. As such, recall bias could limit the findings. Future research could survey women at multiple time points during the course of their pregnancies to assess if there is a change in responses. The survey was also self-report, which could lead to biases in the way women reported perceived feedback. It would be interesting to collect data about the types and amount of feedback pregnant women received as

observed by others. Another potential study design would be to survey non-pregnant members of fitness facilities on their opinions of exercise during pregnancy.

5.2 Future Research

Future research should be aimed at determining what makes women feel uncomfortable exercising during pregnancy aside from social feedback and physical discomfort. Another possible direction of future research could look at the differences in reported feedback in women who gave birth over five years ago.

The atmosphere that women choose for their pregnancy exercise may also have an influence on the feedback that they perceived. The presence of other patrons of the fitness facility and the presence of other pregnant women exercising could contribute to the amount of feedback they perceived. One woman shared that she frequently saw other pregnant women exercising:

> "I did mainly yoga (with some modifications) and walking at our local YMCA, which is very family oriented and even offers prenatal yoga classes. It is not uncommon to see visibly pregnant women and families with infants in strollers walking the indoor track. That probably had an influence on my experiences."

In conclusion, results of this study suggest that some women do perceive a change in social feedback while exercising while pregnant. Given the sample limitations, results should be interpreted with caution and replicated with a larger, more representative population. In addition, further research could include determining the relationship between the type of feedback and women's maintenance of an exercise routine during pregnancy. Future research should be undertaken to determine more clearly the type of feedback that has the most influence on women's exercise behaviors. Determining the types of social feedback

that are most helpful to women exercising during pregnancy could lead to an increase in promotion of exercise behavior. The general public could be informed about the benefits of exercise during pregnancy and encouraged to provide positive support to pregnant women they see exercising. In addition, women could be warned of the potential for negative feedback and can be educated on how to respond to any potential confrontations.

Finally, an idea generated from this study includes the potential development of fitness facilities for pregnant and postpartum women exclusively. As one of the participants detailed above, her confidence was greatly increased by being around other pregnant women exercising. Perhaps if women were more confident exercising during pregnancy they would more quickly return to exercise in the postpartum period, something that is also very important to their health. As detailed above, such an increase in exercise behavior during pregnancy can have many positive effects for both mother and her developing child.

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Appendix A: Survey Materials

Survey Purpose

This study examines perceptions of social feedback received while exercising at fitness facilities during pregnancy as the pregnancy became more apparent to others.

1. I am pregnant.

Yes
No

2. I was pregnant and gave birth to one or more of my children within the last five years.

Yes
No

3. When I was pregnant with one or more of my children, I exercised at a fitness facility where other people were also exercising. (Examples may include the following: traditional gym, yoga studio, community center, YMCA, boutique studio, swimming pool.)

Yes
No

4. I continued exercising at a fitness facility during the time I was visibly pregnant.

Yes
No

Thank you for your interest and help with this research. Over the next few pages we will ask you some brief questions about the feedback you received during the last two trimesters of your pregnancy and some basic demographic information. At the end of the survey we provide you with the opportunity to leave comments or suggestions. Any and all information you provide is kept completely confidential and anonymous. By proceeding with the survey you give your informed consent to participate in this research.

5. During your pregnancy, what was your experience with ***negative nonverbal feedback*** received from other people as your pregnancy became more apparent to others while exercising at a fitness facility? (Examples of negative nonverbal feedback may include being ignored, frowning at you, wrinkled brow and/or shaking head at you.)

Increased
Decreased
No change
Did not experience any negative nonverbal feedback

6. During your pregnancy, what was your experience with ***positive nonverbal feedback*** received from other people as your pregnancy became more apparent to others while exercising at a fitness facility? (Examples of positive nonverbal feedback may include acknowledging you, smiling at you, nodding and/or giving you a "thumbs up".)

Increased
Decreased
No change
Did not experience any positive nonverbal feedback

7. During your pregnancy, was there a change in ***negative direct comments*** to you by other people as your pregnancy became more apparent to others while exercising at a fitness facility?

Increased
Decreased
No change
Did not experience any negative direct comments

8. During your pregnancy, what was your experience with feedback in the form of ***positive direct comments*** you received from other people as your pregnancy became more apparent to others while exercising at a fitness facility?

Increased
Decreased
No change
Did not experience any positive direct comments

9. During your pregnancy, what was your experience with ***negative indirect comments*** (i.e., comments about you that were not directly to you) received from other people as your pregnancy became more apparent to others while exercising at a fitness facility?

Increased
Decreased
No change
Did not experience negative indirect comments

10. During your pregnancy, what was your experience with ***positive indirect comments*** (i.e., comments about you that were not directly to you) received from other people as your pregnancy became more apparent to others while exercising at a fitness facility?

Increased
Decreased
No change
Did not experience positive indirect comments

11. Was this your first pregnancy?

Yes
No

12. During which trimester did you become visibly pregnant while wearing exercise clothes?

First trimester
Second trimester
Third trimester

13. If you stopped exercising during this pregnancy, when did you stop?

_____

14. Why did you stop exercising during your pregnancy?

_____

15. Did you feel confident exercising during your pregnancy?

1 Not at all confident
2
3 Somewhat confident
4
5 Very confident

16. Do you believe exercise during pregnancy is important for women?

1 Not at all important
2
3 Somewhat important
4
5 Very important

Demographics

Please answer the following questions to the best of your ability. All of this information will be kept private and completely confidential.

11. What is your age?

18-20
21-29
30-39
40-45
Other: Please specify

12. What is the highest level of school you have completed or the highest degree you have received?

Less than high school degree
High school degree or equivalent (e.g., GED)
Some college but no degree
Associate degree
Bachelor degree
Graduate degree
Other (please specify)

13. Which of the following categories best describes your employment status?

Employed, working full-time
Employed, working part-time
Not employed, looking for work
Not employed, NOT looking for work
Retired
Disabled, not able to work
Other (please specify)

14. How much total combined money did all members of your HOUSEHOLD earn last year?

0 to $9,999
$10,000 to $24,999
$25,000 to $49,999
$50,000 to $74,999
$75,000 to $99,999
$100,000 to $124,999
$125,000 to $149,999
$150,000 to $174,999

$175,000 to $199,999
$200,000 and up
Prefer not to answer

15. What is your ethnicity/race? (Please select all that apply.)

American Indian or Alaskan Native
Asian or Pacific Islander
Black or African American
Hispanic or Latina
White / Caucasian
Prefer not to answer
Other (please specify)

16. Do you identify with any of the following religions? (Please select all that apply.)

Protestantism
Catholicism
Christianity
Judaism
Islam
Buddhism
Hinduism
Native American
Inter/Non-denominational
Not affiliated, however, I am religious/spiritual
No religion
Agnostic
Atheist
Other (please specify)

Last page of the survey

Comments? Want to be contacted?

17. If you would like to share any other experiences related to your exercise habits and pregnancy and/or share any comments, then please type them here. If you have questions about this research and would like to be contacted, then please email the address below.

ExercisePregnancy@gmail.com

Thank you for completing this survey. Your assistance with this research is appreciated.

Appendix B: Table 1

Table 1

Women Included in Survey

Question	Yes	%	No	%	Totals	%
Question 1	52	6.74	720	93.26	772	100
Question 2	360	50.35	355	49.65	715	92.6
Question 3	130	36.21	229	63.79	359	46.5
Question 4	112	86.15	18	13.85	130	16.8

Appendix C: Table 2

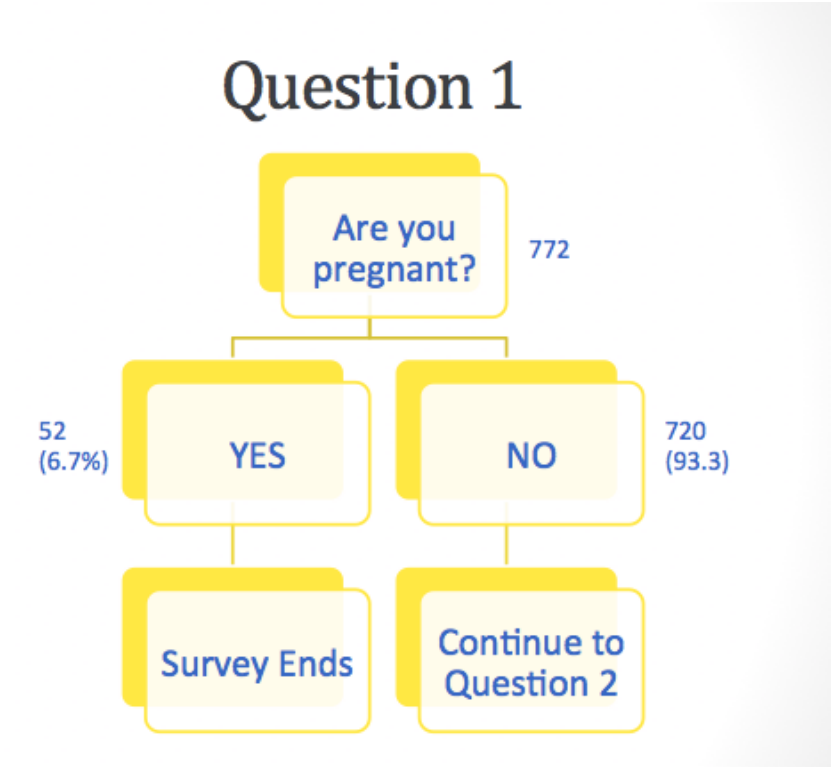
Table 2

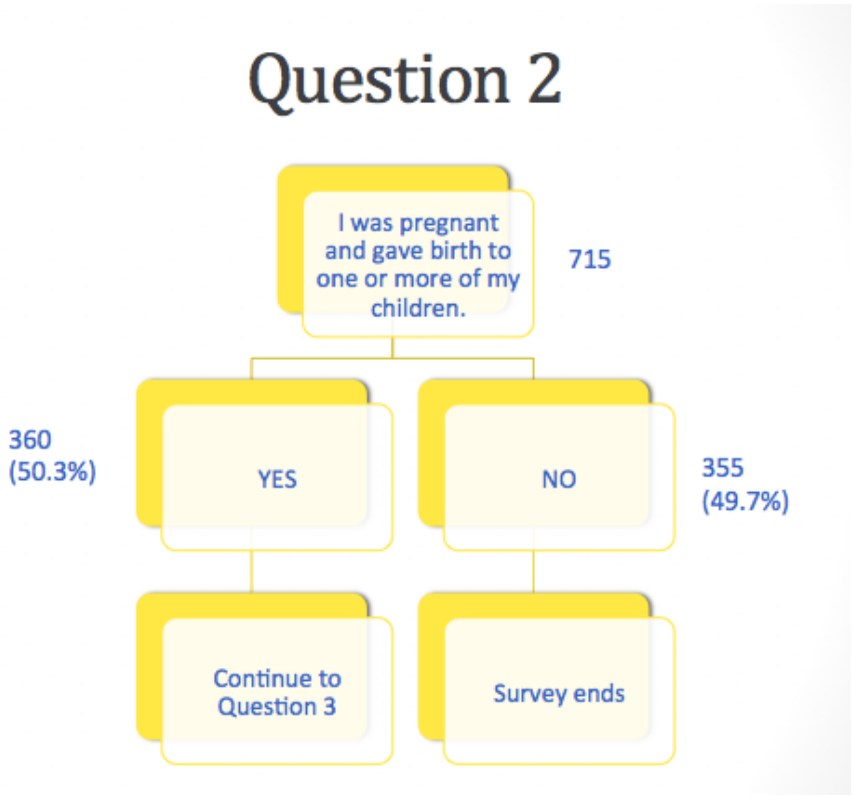
Demographics

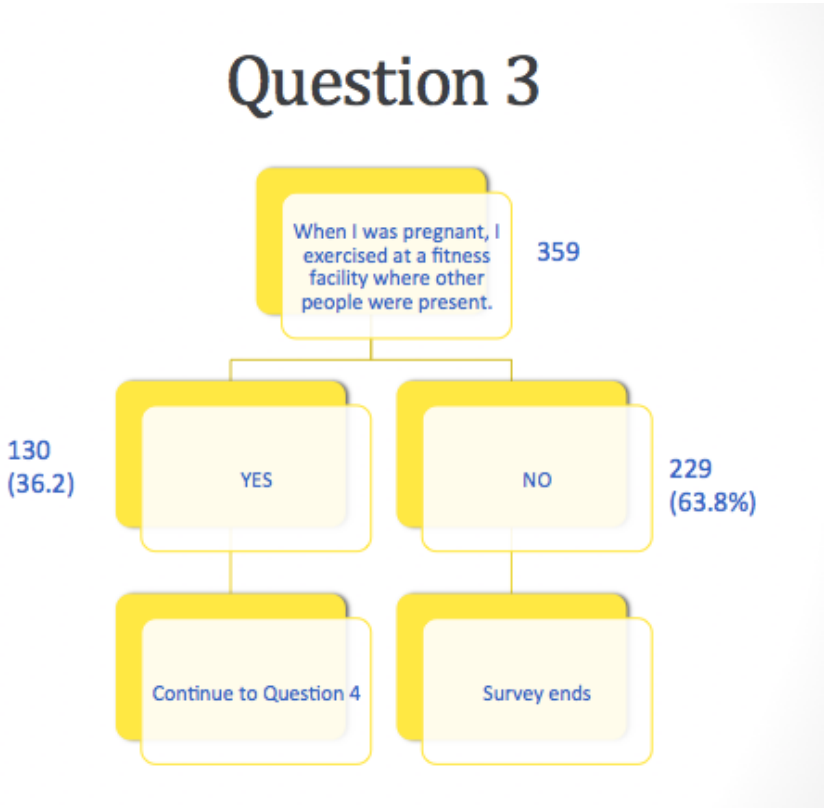
Age in Years	N	%
21 – 29	36	34.29
30 – 39	52	49.52
40 - 45	16	15.24
Ethnicity		
White/Caucasian	85	80.95
Hispanic or Latina	6	5.71
Black or African American	5	4.76
Asian or Pacific Islander	4	3.81
American Indian or Alaskan Native	1	0.95
Prefer not to answer	7	6.67
Education		
Less than High School Degree	1	0.96
High School Degree or GED	7	6.73
Some College but no degree	13	12.50
Associates Degree	8	7.69
Bachelors Degree	34	32.69
Graduate Degree	40	38.46
Other	1	0.96
Employment Status		
Employed Full Time	57	54.29
Employed Part Time	20	19.05
Not employed, looking for work	4	3.81
Not employed, not looking for work	16	15.24
Disabled, not able to work	1	0.95
Other	7	6.67
Religion		
Christianity	31	29.52
Catholicism	19	18.10
No religion	13	12.38
Not affiliated but religious/spiritual	12	11.43
Agnostic	9	8.57
Atheist	7	6.67
Protestantism	6	5.71
Judaism	4	3.81
Buddhism	3	2.86
Native American	3	2.86
Inter/Non-denominational	2	1.90

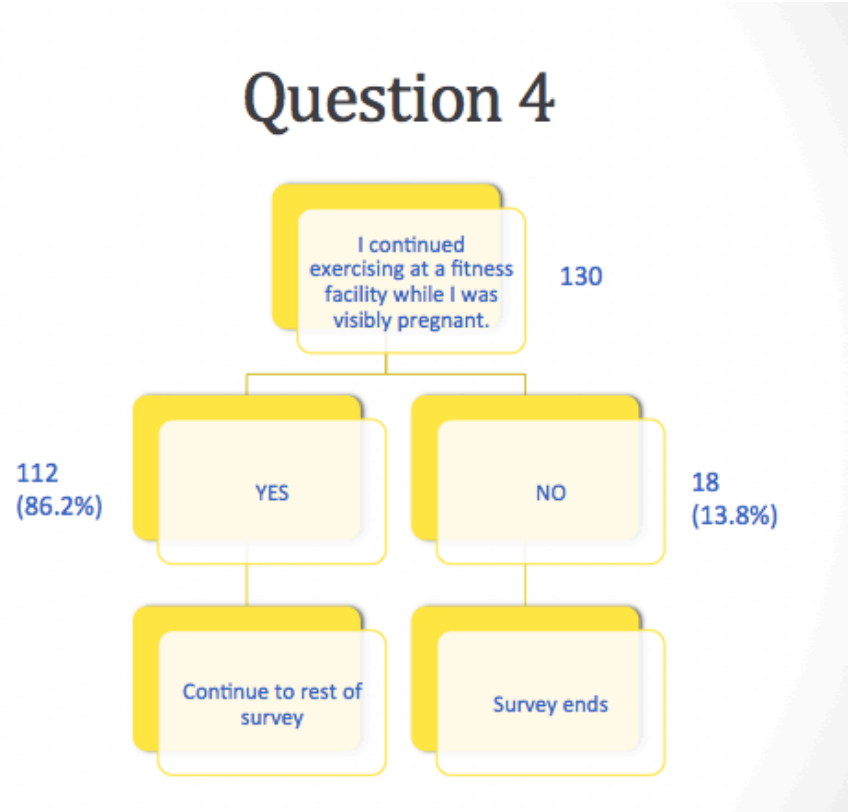
Islam	1	0.95
Other	7	6.67
Household Income ($)		
0 - 9,999	3	2.86
10,000 - 24,999	9	8.57
25,000 - 49,999	15	14.29
50,000 - 74,999	13	12.4
75,000 - 99,999	13	12.4
100,000 - 124,999	20	19.0
125,000 - 149,999	11	10.5
150,000 - 174,999	3	2.9
175,000 - 199,999	2	10.5
200,000 and up	11	10.5
Prefer not to answer	5	4.8

Appendix D: Screening Questions






Question 3
When I was pregnant, I exercised at a fitness facility where other people were present.
359
YES
130
(36.2)
NO
229
(63.8%)
Continue to Question 4
Survey ends


Question 4
I continued exercising at a fitness facility while I was visibly pregnant.
130
YES
112
(86.2%)
NO
18
(13.8%)
Continue to rest of survey
Survey ends